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ABSTRACT

Estimates of graduate science and engineering enrollment are presented based on the results of the third annual National Science Foundation (NSF) Quick Response Survey. This national survey was conducted early in the 1976-77 academic year and was based on a sample of 1,292 graduate departments in 295 Ph.D. granting institutions, including 78 medical schools. Graduate departments in doctorate-granting institutions reported an estimated 1% enrollment rise over 1975. This slight change is in sharp contrast to the 9% increase in 1975 and the 6% increase in 1974. The slight increase in 1976 was probably due to part-time student enrollment increase; full-time student enrollment is estimated to have decreased. (Author/RH)

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Graduate Science and Engineering Enrollment Up Only 1 Percent in 1976

Summary statistics of graduate science and engineering (S/E) enrollment are presented here based on the results of the third annual NSF Quick-Response Survey. This national survey was conducted early in the academic year 1976-77 and was based on a sample of 1,292 graduate S/E departments in 295 Ph.D.-granting institutions, including graduate programs in 78 medical schools. Both master's and doctorate departments were surveyed. The term "science," as used here is understood to include engineering. A description of the survey methodology appears in the technical notes.

- Graduate S/E departments in doctorate-granting institutions reported an estimated 1-percent enrollment rise over 1975, or a fairly "steady state" in the enrollment picture in early fall 1976.[1] This slight change in master's- and doctorate-level enrollment is in sharp contrast to the 9-percent increase in 1975 and the 6-percent rise in 1974.
- The overall increase from 290,700 students in 1975 to an estimated 293,600 in 1976 was attributed primarily to the influx of approximately 5,800 students enrolled part-time, 7 percent over 1975. Enrollment of full-time students is estimated to have decreased by about 2,800.

Overview

The slowdown in the growth rate of S/E graduate enrollment, as estimated from the NSF sample survey, follows the pattern of other recent national enrollment projections. For example, the National Center for Education Statistics (NCES) conducted a sample survey in fall 1976 that showed virtually no change in enrollment over 1975 in all levels of higher education.[2]

The largest percentage increases in graduate S/E enrollment occurred in the environmental and health sciences, up about 8 percent each (table 1). Other sizable increases occurred in the agricultural and biological sciences, as well as in psychology. Graduate enrollment in the social sciences, where more than one-fourth of the total number were enrolled, increased only slightly.

The estimated 7-percent rise in part-time enrollment, from 80,000 to approximately 85,800 graduate science students, represents a continuation in the growth trend that first became apparent in the early seventies. Part-time study, which accounts for about 29 percent of total graduate enrollment in the sciences and engineering, allows graduate students to work at a full-time job to meet the rising costs of graduate tuition during a period

Table 1.—Graduate science enrollment, by area: 1975-76

Area of science	1975	1976 estimate	Percent change	Range of percent change at 95 percent confidence level
Total, all areas	290,700	293,600	1.0	-0.3 to 2.3
Engineering	67,300	66,900	-0.6	-4.3 to 3.1
Physical and environmental sciences				
Total	71,900	71,400	-0.7	-3.7 to 4.1
Physical sciences	24,300	24,100	-0.8	-4.2 to 3.0
Environmental sciences	10,400	11,200	7.7	1.0 to 14.4
Mathematical and computer sciences	36,800	36,700	-0.3	-4.0 to 3.4
Life sciences				
Total	74,500	77,200	3.6	-1.1 to 8.3
Agricultural sciences	11,900	12,300	3.3	-2.2 to 8.7
Biological sciences	41,500	43,200	4.1	-1.0 to 9.2
Health sciences	21,100	21,700	2.8	-1.7 to 7.3
Psychology	27,100	28,200	4.2	-0.9 to 9.3
Social sciences	76,800	77,600	1.1	-2.0 to 4.2

Source: NSF, National Science Foundation

(Prepared in the Universities and Nonprofit Institutions Studies Group, Division of Science Resources Studies.)

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when Federal fellowships and traineeships have been drastically curtailed. The life sciences and psychology, however, accounted for virtually all of the increase in the number of students enrolled part time in graduate programs; each of these broad areas increased by an estimated 25 percent between 1975 and 1976. Engineering enrollment of part-timers, however, was down 8 percent, accompanied by a 4-percent drop in the mathematical and computer sciences.

While overall part-time enrollment continued its upward momentum, full-time enrollment is estimated to have fallen slightly. Only three areas of science showed full-time enrollment gains between 1975 and 1976—the environmental, agricultural, and biological sciences (table 2). For the latter two, the 2-percent increases represented a considerable slowdown in growth from the previous year. The decline estimated in full-time enrollment in each of the other areas represents a reversal over the previous year's gains.

First-year students entering graduate level S/E programs on a full-time basis were down an estimated 5 percent from 1975, after a strong increase the year before. However, first-year entrants in three areas were up—the physical and environmental sciences and psychology. The slowdown in full-time enrollment was also evident among students beyond their first year but to a lesser extent. The overall number of these students increased about 1 percent compared with nearly an 8-percent increase in 1975.

Table 2.—Full-time graduate science enrollment, by area and level of study: 1974-76

(Percent change)

Area of science	Total		First year		Beyond first year	
	1974-75[1]	1975-76[2]	1974-75	1975-76	1974-75	1975-76
Total, all areas	8	-1	8	-5	8	1
Engineering	9	-1	11	-7	7	4
Physical and environmental sciences, total	1	1	5	4	(3)	(3)
Physical sciences	(3)	-2	3	-5	-1	-4
Environmental sciences	5	8	8	2	3	13
Mathematical and computer sciences	-3	-3	7	-9	(3)	1
Life sciences, total	8	1	6	-2	9	6
Agricultural sciences	11	2	12	-9	11	10
Biological sciences	8	2	7	-5	8	5
Health sciences	6	-3	2	-11	10	5
Psychology	4	4	3	4	7	3
Social sciences	13	4	13	-7	14	12

[1] Based on data reported in NSF's 1975 Survey of Graduate Science Student Support and Postdoctorals. See "Science Resources Studies Highlights," "Self Supported Graduate Science Students Increased by 22 Percent in 1975" (NSF 76-320) September 30, 1976.

[2] National estimates from NSF's 1976 Quick Response Survey.

[3] Less than 0.5 percent change.

SOURCE: National Science Foundation.

Technical Notes

The Quick Response Survey (QRS) is designed to estimate changes in graduate science enrollment in Ph.D.-granting institutions that may have occurred in any of the major areas of science over the previous year. In its third consecutive year, the QRS consisted of a stratified random sample of 1,292 graduate S/E departments in 295 doctorate-granting institutions, including 78 medical schools, based on the departmental and institutional population of the 1975 Survey of Graduate Science Student Support and Postdoctorals (GSSSP). The 1976 sample was drawn from 5,716 departments that reported graduate student enrollment in the 1975 GSSSP survey[1] (table 3).

For the four data items requested on the QRS questionnaire (total full-time and first-year full-time enrollment plus total part-time and first-year part-time enrollment), each department's 1975 response to the GSSSP questionnaire was pre-entered to ensure comparability between 1975 and 1976 data. Respondents were requested to make corrections to the 1975 data, if necessary.

A postsurvey audit of 100 departmental responses to the 1975 surveys revealed that inconsistencies in reporting, rather than sampling error, were the major sources of differences between the QRS and GSSSP statistics. In an attempt to reduce reporting error in 1976, the QRS questionnaire was mailed two weeks later in the academic year than in 1975; however, many departments still reported difficulty in providing their estimates because of incomplete institutional records and utilized the pre-entered data as the basis for the current year's estimates. Also, pre-entered data from an academic unit were sometimes updated even though the current unit's composition may have changed during the year. The use of actual department names on the 1976 QRS questionnaire, as well as more intense editing efforts, were used in an attempt to reduce reporting error as much as possible in the 1976 survey.

The sample was stratified by broad area of science, full-time enrollment size class, part-time enrollment size class, and level of study (first-year and beyond). The 1976 sample expanded the areas of science classification used in the 1975 QRS by providing separate enrollment estimates for physical, environmental, and mathematical sciences, as well as biological, agricultural, and health sciences. Stratification of the departments by type of control (public vs. private) was not employed this year as a variable after statistical testing showed no significant difference in enrollment patterns between public and private institutions.

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Data received from the full-scale 1976 GSSSP, which was mailed out in late November 1976, will be summarized in a *Science Resources Studies Highlights* in early summer 1977. From this detailed survey, additional information will be available on types and sources of financial support of full-time S/E graduate students, sex, citizenship, and level of study, as well as support mechanisms of postdoctorals. For additional information on this data collection series, please contact Ms. Penny D. Foster, Division of Science Resources Studies (202—634-4630).

[1] The total number of departments included in the 1975 GSSSP was 7,664. Of these, only 5,716, or 75 percent, reported graduate student enrollment. The remainder reported only the utilization of postdoctorals.

Table 3.—Distribution of departments in 1975 GSSSP survey as compared with 1976 QRS

Area of science	Departments with at least one graduate student in 1975 GSSSP[1]		Departments in 1976 QRS[2]	
	Number	Percent distribution	Number	Percent distribution
Total, all areas	5,716	100.0	1,292	100.0
Engineering	1,001	17.5	221	17.1
Physical and environmental sciences, total	754	13.2	186	14.4
Physical sciences	503	8.8	130	10.1
Environmental sciences	250	4.4	56	4.3
Mathematical and computer sciences	370	6.5	81	6.3
Life sciences, total	2,211	38.7	424	32.8
Agricultural sciences	312	5.5	62	4.8
Biological sciences	1,380	24.1	264	20.4
Health sciences	521	9.1	98	7.6
Psychology	274	4.8	95	7.4
Social sciences	1,103	19.3	285	22.1

[1] NSF's 1975 Survey of Graduate Science Student Support and Postdoctorals.
[2] NSF's 1976 Quick Response Survey.
SOURCE: National Science Foundation.